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ABSTRACT

This paper reviews the need for governing boards of colleges and universities to respond to rising educational costs, pressures to improve student learning, and rapid technological advances. The first part of the paper describes the current forces for change and the need to reorganize administrative work. The example of Antioch University's ongoing success in building a more cost-effective, efficient administration with development of a new central administration and contracting-out of computer services is described. Antioch University is composed of five small campuses with enrollments of 600-1,000 full-time-equivalent students in four locations: Ohio (two campuses), New Hampshire, Washington, and California. The projected savings are reported to be a 60 percent reduction in administration staff and 40-45 percent reduction in costs. The second part of the paper discusses the need to rethink how faculty can contribute best to student learning while reducing costs. Key elements of optimal learning identified from research findings are specified including such factors as motivation, intense faculty-student contact, and feedback. The paper urges the restructuring of faculty roles and practices to incorporate these elements and new learning technologies. It suggests that faculty involve themselves more in coaching, the use of simulation technology, and facilitation of small group instructional processes. Also proposed are major alterations in the academic calendar to allow greater flexibility using different time patterns and alternative delivery modes. (JLS)

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Association of Governing Boards
of Universities and Colleges

Reducing Student Costs and Enhancing Student Learning

The University Challenge of the 1990s

By Alan E. Guskin

AGB OCCASIONAL PAPER No. 27

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Executive Summary

The future of colleges and universities rests in their response to rising educational costs, pressures to improve student learning, and rapid technological advances, according to Alan E. Guskin, chancellor of the Antioch University System. To reduce student costs and increase student learning, institutions must make significant, even radical changes in their administrative structures and faculty roles.

In the first part of this paper, Guskin reviews today's forces for change and the need to reorganize administrative work. He describes Antioch's ongoing success in building a more cost-effective, efficient administration, but he stresses that these changes alone will not produce sufficient savings or enhance student productivity.

The more essential undertaking, discussed in the second part of the paper, is rethinking how faculty contribute best to student learning at reduced costs. Guskin identifies key elements of optimal learning from research findings, such as motivation, intense faculty-student contact, and feedback. He then suggests how to restructure faculty roles and practices around these elements and new learning technologies.

"Reducing Student Costs and Enhancing Student Learning: The University Challenge of the 1990s" originally appeared in *Change* magazine in two parts.

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Reducing Student Costs and Enhancing Student Learning
The University Challenge of the 1990s

by Alan E. Guskin

Restructuring The Administration

Colleges and universities today face their most significant crisis in more than 40 years. The analysis of this crisis has coalesced over the last year with a focus on the double-edged sword of costs: The expenses of institutions are too high for their revenues and the costs of what we offer are growing beyond students' (and their families') capability or willingness to pay. If there are any doubts, a quick reading of the popular or higher education press will make the point:

- A *USA Today* cover story projects tuition costs in the next 10 years that appear overwhelming to all but the wealthy.
- *Business Week*, in a substantial article on the economics of higher education, lists examples of significant cuts at major universities: 120 faculty at Syracuse, 33 faculty and 200 staff members at Tulane, a 2 percent cut at the University of Michigan.
- For each of the last two years, at least 50 percent of the public universities have experienced mid-year budgetary cuts.
- A number of major universities have had no salary increases for two to three years, including all public universities in California and the University of Minnesota; a number of prestigious liberal arts colleges also have had no salary increases in one of the last two years.
- The chancellor of the largest university system in the country reports, "I have downsized the State University of New York by 12 percent" as a result of a $200 million cut imposed by the legislature. "We've released tenured professors, terminated viable programs. We're dangerously depleting physical stock."

I believe we have the capability to survive creatively if we choose to do so, but we will flourish only with significant, even radical, changes in how we organize our administrative structures and educate students. My fear is that because we rebounded so well from the financial problems of the early 1970s and '80s, those successes will make us cynical and cause us to shrug off the major changes required to deal with the rest of the '90s. But right now is the wrong moment for driving into the future with our eyes on the rear-view mirror.

Throughout this decade, the pressures for change will be enormous. I believe three major forces will alter our colleges and universities over the next five to 10 years, whether we like it or not:

1) The high costs associated with undergraduate education in the public and private sectors will give rise to overwhelming pressures to cut back expenses rather than increase tuition.
2) There will be an ever-growing demand from many sectors of society that we document and improve student learning outcomes.
3) Soon the new information technologies will provide the capability to alter how students learn and how faculty teach.

The Costs of Education

People are beginning to make comparisons between the economics of higher education and the health care system. And the comparisons are surprising: costs that rise relentlessly; the unwillingness of providers to deal directly with the core delivery system; governance structures that rest decision-making power about costs in the hands of professionals whose personal interests are compromised by reducing costs; beliefs that increases in quality always require increases in expenditures; and a decentralized system that is heavily underwritten by federal dollars, but allows federal policymakers little direct capability to reduce costs. These are not small issues. The frustrations, even anger, they produce find new expression in a host of recent federal and state "accountability" initiatives—SPREs, report cards, faculty workload legislation—all questioning the public value delivered by higher education.

Beyond legislation, the litany of pressures on the cost side is very real:

- Institutional expenses increase relentlessly and are not being offset by non-tuition income.
- Increases in tuition and fees outstrip the capability and/or willingness of prospective students, or the public generally, to pay. Our tuition costs increasingly seem not to be credible for the educational value received; every cut-back we make decreases the perceived value of what we offer.
- Federal and state fiscal priorities likely will lead to a flattening of support over the next decade rather than increases. Higher education is becoming the fourth or fifth funding priority behind K-12, health care, welfare, and prisons.
- In the public sector, public demands for access likely will mean forcing more and more students into existing institutions, with little more in the way of financial support.
- In private institutions, financial-aid costs seriously impede the ability to fund basic needs. As tuitions rise, more students need financial aid but less federal and state financial aid is available; so colleges increase tuition even higher to fund the needs of financial-aid-dependent students. The result has been massive tuition discounting, with many institutions now pouring an

unsupportable 20 to 40 percent of precious educational dollars into the aid kitty.

The cumulative message should be clear, even to the most skeptical: We must indeed figure out creative ways to reduce institutional expenses and then to reduce student costs.

Student Learning

Whether from employers or state governments, parents, accrediting associations, or students themselves, people want to know they are getting a good return on their own and society's educational investment. Higher education no longer can avoid demonstrating to professional and political audiences, as well as the general public, that appropriate levels and forms of student learning result from the undergraduate education we offer.

For decades, universities and colleges have wanted to define academic quality in terms of resources: faculty scholarship and degrees, the depth and breadth of curricular offerings, and the presence of top-flight laboratory, library, and like facilities. More recently, many institutions—and many parents and students—have come to define undergraduate quality in terms of faculty reputational rankings, campus beauty, and the range of recreational and support services offered students.

It is these definitions of quality that have led to, among other things, the proliferation of disciplinary programs based on the interests of faculty members and to the significant increase in expenses for student-support services over the last 15 years. Magazines comparing colleges and universities have come to focus on these issues rather than on what is happening to students, reinforcing this status quo.

These definitions of quality are just beginning to be questioned on a grand scale, and I'm afraid we're not ready with answers. We are so wedded to a definition of quality based on resources that we find it extremely difficult to deal with the *results* of our work, namely student learning.

While the preparation of faculty members and character of institutional facilities are important resources for student learning, it is far from clear that there is a straight-line relationship between them and the fact of student learning. Indeed, the contribution of faculty teaching to student learning is for the most part unexamined. Rarely do faculties think hard together about how students learn, about the implications of research on student-learning styles and multiple intelligences, or about developmental issues based on the age, gender, race, nationality, or life experiences of the students being taught. Faculty members are not trained or accustomed to think about learning processes and outcomes.

Just as difficult to change is the important, implicit assumption held by most faculty that a university is inherently a selective environment. If students don't perform well, it's their problem (or fault), irrespective of how they were taught, the environment in which they were asked to learn, or differences in their learning styles. The notion that there is or should be a direct relationship between student attainment, the tuition students pay, and the compensation of faculty members seems utterly foreign.

The truth about our present arrangements is that, for the most part, we do not know how well students have learned what they've studied, or whether they know and can do what their baccalaureate should imply. For now, most institutions and their faculties continue to avoid public and professional questions about student learning outcomes, perhaps on the (false) notion that all the fuss about them will soon pass away. But it won't.

Focusing on student learning turns our thinking about the future of our colleges and universities upside down: from faculty productivity to student productivity, from faculty disciplinary interests to what students need to learn, from faculty teaching styles to student learning styles, from classroom teaching to student learning. These are the kinds of shifts that more and more parties are coming to see as necessary; the pressure to refocus on student learning has only begun, I believe. "Outcomes" thinking has all but carried the day in health care and K-12; now these pressures to account for student and institutional performance—driven by questions of costs—will be ours.

New Technologies

For many years, we've heard about the huge benefits that would accrue from new electronic technologies. But the results always seemed to be disappointing, especially given the publicity and cost. Hence, some wariness on the part of faculty members and academic administrators may seem justified. But the new electronic technologies, I believe, are for real. The new international data highways, the inexpensive but extraordinarily powerful computers available, breakthroughs in interactive software—all these and other developments are ready to deliver on the promises.

When these new technologies are combined with students who have grown up with computers and Nintendo games, tremendous opportunities for new types of learning environments will evolve, circumstances that will both augment and replace classroom settings. The question is whether faculty members who grew up in a very different technological environment will be able to adapt to these new opportunities. Given the potential financial savings and the power of these tools for student learning, there will be a great deal of pressure to adopt them.

These new electronic technologies not only will be a powerful supplement to faculty teaching, but they may replace many learning activities faculty are now performing, even in small colleges. After 25 years of promise, that reality seems ready to happen.

Returning to my basic point: The costs of education, the demand for enhanced learning outcomes, and rapid advances in technology will bring pressures for radical change in the administrative and educational practices of American higher education. Our need is twofold: to reduce student costs and increase student learning.

The Need to Restructure

Colleges are, in many ways, potential victims of their own success over the last 40 years. In this, they are in good company, given what's happened in the corporate sector and in health care. As Michael Hammer and James Champy put it in *Reengineering the Corporation* (New York: Harper Collins, 1993),

> *The ironic truth is that American companies are performing so badly because they used to perform so well ... the principles on which they are organized were superbly suited to the conditions of an earlier era but can stretch only so far.*

The administrative structures of our universities and colleges are organized like our businesses and suffer similar problems. Indeed, we were told two decades ago we should operate in a more business-like manner, and thus we have: We automated, we did marketing studies, we invested more wisely, we centralized and controlled, we strategically planned, and we used consultants. In the '80s, university administrative offices grew and grew, fueled by federal and state regulations but also by our perceived need to be professional and to serve better. In this we watched our competition, sometimes too closely.

Over these years, even smaller institutions developed impressive sports facilities and the coaches and teams to match them; all seemed to become full-scale, full-service communities, providing all levels of amenities, entertainment, and culture; many of us developed first-class recreational facilities that rival the best country clubs. These new and upgraded services increased institutional personnel and general-expense costs; indebtedness and fund-raising efforts focused more and more on non-educational ventures.

The nature of this growth is reported in a recent study by the Pew Higher Education Research Program (Feb. 1993, Vol. 4, No. 4, Sect. B), "Expenditure Growth in Higher Education 1975-1990":

These patterns...suggest that as the comparatively mild growth in the late 1970s gave way to the boom of the 1980s, initial institutional investment strongly favored administrative expansion. Part of the administrative growth of the early 1980s may have resulted from deferred maintenance, the need to comply with increased regulations, and increased reporting requirements to government agencies. Nevertheless, a significant share of the growth reflects the sheer expansion of a professional culture within higher education's administrative ranks.

Justifying this rate of growth and maintaining the size of the administration was not difficult. Peer-institution analyses developed by national associations of the professional groups (admissions officers, registrars, business officers, development officers, financial aid officers, student activities coordinators, housing directors, student union directors, and so forth), showed that each new expenditure was "appropriate." In the case of those in the lower two quartiles, arguments were made that the growth was not adequate.

It is not surprising that the administration grew in these last three decades, or that in a period of growth like the '80s all was forgiven. But in the '90s, we face a new environment, one that we are not organized to deal with. In discussing the corporate sector, Hammer and Champy sum up part of our problem:

Inflexibility, unresponsiveness, the absence of customer focus, an obsession with activity rather than result, bureaucratic paralysis, lack of innovation, high overhead—these are the legacies of one hundred years of American industrial leadership. These characteristics are not new; they have not suddenly appeared. They have been present all along. It is just that until recently, American companies didn't have to worry about them. If costs were high, they would be passed on to the customers. If customers were dissatisfied, they had nowhere else to turn. If new products were slow in coming, customers would wait. The important managerial job was to manage growth, and the rest didn't matter. Now that growth has flattened out, the rest matters a great deal. America's business problem is that it is entering the twenty-first century with companies designed in the nineteenth century to work well in the twentieth.

How true so much of this is for so many universities and colleges! Yet significant, even radical, change in how our administrations are organized is a tall order, due to their professional administrative culture and bureaucratic structure.

A recent report by the Pew Higher Education Research Program (March 1992, Vol. 4, No. 2, Sect. B) on how universities and colleges are

responding to the '90s financial problems indicates some good news, but mostly bad. The 12 institutions in the study were chosen "because they were perceived by their peers to have adopted interesting approaches to budgeting challenges."

The good news is that these nine colleges and three state higher education systems were going beyond the typical university response to financial problems; that is, they were doing more than just "raising tuition revenue and imposing budgeting discipline." The study indicates that institutional leaders are beginning to take seriously the need for a "fundamental reassessment of the scope and operations" and that of the selected institutions, "each had taken measures to achieve greater operational efficiency, while at the same time tangibly committing to quality enhancement."

The researchers were left, however, with the "prevailing impression...of the inherent difficulty in rethinking patterns of institutional growth and contraction...."

- [The interviews] did not reveal any significant instances of colleges and universities utilizing technological advances to re-engineer administrative work. It appears that...technology has been used almost exclusively to automate existing practices.
- There was little evidence that institutions combined staff layoffs with a rethinking of administrative structures or work practice....
- The case studies revealed that extreme financial shortfalls do not deepen an institution's engagement with restructuring. On the contrary, a severe budget crisis requires immediate action, and the urgency constrains options to those that reduce funds uniformly across academic units and programs.

My own observation is that in most institutions we've seen cost cutting and minor changes but not significant restructuring. Or, to state it another way, we are, with some good exceptions, still employing the methods of the '70s; namely, cutting and combining.

Cutting academic programs or parts of administrative departments won't work, for the underlying cost factors will rise up again. The reason is that the present cost structure is not sustainable over time. Daniel Cheever, a former college president, sums up the present predicament: "After a year or two of serious cost cutting, many colleges will again face the relentless upward pressure to increase expenses, albeit from a lower base" ("Tomorrow's Crisis: The Cost of College," *Harvard Magazine*, Nov./Dec. 1992).

In the academic area, it seems that we are not yet ready to face directly the nature of the educational process itself, because we are not examining how faculty contribute to student learning. Basically, our

orientation is that faculty do in the classroom what they should do, except that they should do a little more of it. If there are financial problems, then we should "restructure" by cutting programs or the number of faculty, but not change how faculty work.

The same basic orientation seems to hold for dealing with administrators; cut and combine, but leave the basic services and work intact. The only problem is that there is work to be done in the organization and if the work is not restructured significantly someone will still have to do it. The key to dealing with lower revenue while maintaining quality lies in rethinking the nature of the work being done.

Hammer and Champy sum it all up simply when they ask their basic question, "If I were re-creating the company today, given what I know and given current technology, what would it look like?"

Simple words, but tough to enact, because the interests of different institutional units and the people who represent them are so deep. In many ways, one can sum up the problem of how to make significant structural changes by saying that you just can't get there by muddling forward from here. We first have to figure out what "there" is, and then develop the means to get there. That requires that we look deeply into our assumptions about how we are organized.

One of the best examples of being wedded to an unquestioned assumption is the notion that centralized administrative services are most cost effective and efficient. The logic of this assumption drove administrative action throughout higher education and business until very recently. How can five business offices be justified when one can do it? How can decentralized computer systems be justified when one central machine can do it all?

This logic breaks down when we look at the effectiveness and impact of such systems on the people being served—whether customers, students, or faculty. Are people better served? The answer seems to be no, for various reasons.

First, centralized systems seem to grow inexorably (and without any real analysis of costs). Relatively unaccountable central administrators add staff to meet their needs without having to justify it to anyone but one another. The more professionalized an administrative area becomes, the more its size seems to grow to perform "needed services." The services may be real, but the cumulative costs soon become too great for the institution to afford.

Second, centralized systems become bureaucratic, which in its worst form leads people to defer decisions to the highest level, thereby

creating bottlenecks and often poor decisions. People with the most formal authority and least information make decisions with far-ranging impact, yet they get little feedback since the decision's effects are remote from them. In turn, local people who must live with the decision (and who often know what should have been done) feel powerless and discouraged.

So we need the courage to ask, "If we were creating this university administration today, given what we know and given current technology, what would it look like?" This is a difficult question to ask and its implications are even more difficult to follow. Yet I believe it can be and must be done. If, following institutional priorities, we decentralize everything that can be decentralized and integrate and centralize only those things that are absolutely essential (and review these "essential" assumptions continuously), less can be more: fewer people, lower office costs, more local accountability, more access to decision-makers, and more and better decisions. To be effective in doing this, we need to focus on student learning and student costs, not on the professional needs of administrators or faculty.

Antioch: A Brief Case Study

My own recent experience might be helpful in reviewing how one university chose to deal with changing the central administrative areas and the difficulties in doing so. We nearly have completed a major restructuring and reengineering of the university's central administration, which has reduced significantly the administrative overhead costs at a savings to the institution of over $750,000 a year. (The total budget for the university is about $40 million; the central administration's budget in 1993, prior to implementing this change, was $4.1 million.)

Antioch University is composed of five small campuses with enrollments of 600 to 1,000 full-time-equivalent students in four different geographic locations (Antioch College in Ohio and four campuses serving adult learners in New Hampshire, Ohio, Seattle, and Southern California) and a central administration, with a total university enrollment of approximately 4,000 students. While we are now financially in good shape, the overhead costs needed to support the central administration had become burdensome. At the same time, the central administration, which had dealt very effectively with past problems, was based on a hierarchical and centralized organizational culture.

We were determined to reduce these overhead costs and change our command and control culture by decentralizing many central functions to the five campuses, most of which already had staffed up to deal with their increased size; four of the five campuses had increased their

enrollment by about 75 percent in the last five years. We started out to decrease costs by reducing the size of the central administration, department by department. It took more than a year to attempt the first departmental change. It became clear rather quickly that the staff's resistance and collusion would make it impossible to accomplish the entire central administrative change envisioned within a reasonable period of time, if ever. It was also clear that our computer center was not up to the task.

We then decided to spend about a year developing a consensus among the senior administrative leadership of each campus and the president regarding the need to make basic structural changes to the entire central administration. We soon realized that the only way we could accomplish our goal of significant reductions in university overhead expenses and decentralization to the campuses of all day-to-day activities was literally by starting over, and building a conception of a central administration based on a new culture and philosophy of collaboration and partnership. And that's just what we did.

We made two key policy decisions at the senior administrative level of the university: First, we would close down the central administration and build a new one and once started we would not turn back. As someone once said, you can only leap over a large chasm in one jump, you can't stop in the middle. All the senior administrators were aware of this when we made our decision. Second, we would create a highly collaborative implementation process: Technical resource groups for each major administrative area made up of middle-level managers from each campus were created (e.g., chief fiscal officers, registrars), along with a central planning/transition group. These groups were responsible for recommending operational policies for each area to the senior leadership group of the university—made up of the chief administrator of each campus and the president—which made all the final decisions. The major requirement was that all operational policies had to follow an overall timetable and the computer systems design.

To accomplish this we made two operational decisions. First, the central administrators below the president were not permitted, without the president's approval, to participate in the planning and implementation sessions for the new central administration. Second, we contracted out and upgraded the computer center and created a plan to change our computer capability to up-to-date, microcomputer-based technology for all financial, development, personnel, registration, and admissions functions. In each area, administrative systems and operating procedures are being developed around these new technologies. Within a year or so there will not be any mainframes or minicomputers at Antioch University.

We are in the middle of reengineering the central administration's work and should complete almost all of it within a year—about two and a half years after we began implementation and more than four years since we initiated discussions about decentralizing the central administration. All the administrators in the new central administration will have different responsibilities from in the old one, including the chief executive officer and especially the chief financial officer of the university. Some of the new functions will include long-range, universitywide financial planning, staff training of middle-level managers on the five campuses, new management information and computer systems, new universitywide standardized operational procedures, and a universitywide electronic library function. In turn, each of the five campuses will perform all the day-to-day administrative functions, many of which were previously performed centrally with a great deal of duplication on the campuses.

The savings will be a 60 percent reduction in the present central administration personnel—a cut of 14 people—and a 40 to 45 percent reduction in projected costs at the central administration level (a *total* cut of about $1.6 million). When all increases to accommodate the new decentralized structure at the five campuses are taken into account, the total annual savings will be about 25 percent ($750,000) of the total projected costs of the central administration. Most significantly, the culture of the university administration has been altered radically.

What has impressed me more than anything else is not our success to date, which is considerable, but how much effort and continuous vigilance it has taken—and how absolutely critical is the metaphor (and conception) that we're closing down one central administration and starting a new one. I also was impressed with how the implementation effort evolved over time and that we were unable to predict fully all the many outcomes, a fact that made some people uncomfortable with our level of planning.

While the savings over the next five to ten years created by restructuring the central administration will be considerable, they still will not be enough to deal with the need to reduce the high levels of student costs and institutional expenses. Therefore, in the next three to four years, we probably will face continuing restructuring in the administrative areas throughout the university and begin the most challenging task of all, restructuring the role of faculty.

Some Tough Realities

Our nearly three-and-a-half-year experience at Antioch has led to the following observations:

- You can't get there from here, because the "here" is divided into

a myriad of distinct departments or units based on external standards and supported by an internal administrative professional culture.

- Major restructuring changes require a conception of the restructured administrative structure, the "there," as a new organization, because it really is. Metaphorically (and really!) we are closing one unit and opening another. Not only are the tasks to be performed different, but the culture has to be different.
- Because resistance exists in many places, vigilant leadership is essential. The basic decision to restructure is ultimately not a collaborative one. However, planning and implementing the restructuring effort can and should be participative and collaborative. The people included in such open, collaborative processes should be those who conceive of themselves as part of the restructured organization, rather than those who conceive of themselves as part of the organization being closed.
- It is likely that some important senior and/or middle-level administrators will have to leave and/or be totally bypassed in the restructuring process.
- The use of new computer technologies is essential in the restructured administrative organization, and the new restructured roles should be built around the power and potential of the computers. This is a major shift in thinking. Hammer and Champy put it succinctly: "[T]he fundamental error that most companies commit when they look at technology is to view it through the lens of existing processes.... The real power of technology is not that it can make the old processes work better, but that it enables organizations to break old rules and create new ways of working." But no one should be sanguine about the difficulties in doing this; introducing new computer technologies is never easy and never follows the simple path predicted.

One fascinating aspect of the entire planning effort was the paradoxical nature of the process, which at times was unnerving. A powerful hierarchical decision had to be made to move from a command and control to a collaborative, partnership-oriented administrative culture; a centralized decision was required to decentralize; and the decentralization of the university administrative structure led to the increased integration of the university.

The basic decision to decentralize—the goals and strategy—required an intuitive leap by a few university leaders. At the same time, adherence to the goals and basic strategy throughout the administration was and is essential: If this elaborate change effort were to be successful, no one could be permitted to stand in the way of the implementation, no matter what his or her position. After that point, collaboration and flexibility were vital.

Philosophically, especially given the strong egalitarian nature of Antioch, the paradoxical nature of the entire administrative restructuring—where hierarchy was needed to produce collaboration—was personally problematic for many people. Nevertheless, the reality for the middle managers on each of the five campuses, the staff members most affected by this change, has been their collaboration with each other and active participation on all key universitywide decisions affecting their areas. Almost everyone involved seems to feel that the basic strategy is working—although not without bumps and bruises—and that they are much more integrated into the university as a whole.

A Caveat

I have one caveat about restructuring in colleges and universities: Implementation of radical alterations in all administrative areas must precede implementation of major changes in the role of faculty. I assert this for strategic and tactical reasons. Strategically, enhancing student learning and reducing student costs are, in my judgment, the primary yardsticks for any changes. Since the faculty and academic areas are most directly tied to student learning, alterations in the lower-priority support areas must precede them. Tactically, faculty will be asked to change how they work, and they have a great deal of control over what they ultimately do. University and college leaders would have little credibility in challenging faculty members to change their work so significantly and reduce the total size of the faculty if they themselves were reluctant to radically alter the size and work of the administrative and service areas. Beyond this, by making these changes first, administrators may be presenting a model to the faculty on how it might be done.

Having said this, I also recognize that even significant alterations in how administrative work is organized will not produce enough savings to significantly reduce student costs. The faculty and related academic support staff and expenses represent at least 50 percent of the cost structure of most universities and colleges, while administrative costs probably represent about 25 to 30 percent. Significant reduction in university expenses will have to involve major cost savings in the academic area.

Restructuring the Role of Faculty

Restructuring the role of faculty members will, at first, prove to be a monumental undertaking. All of the incentives seem against doing so—except, in the end, survival. For over three decades faculty have been trained and rewarded to "do their own work"—namely, research, writing, consulting, and so on—often with a lightening of their teaching "load." During this same period, university governance structures have shifted powerfully to emphasize the primacy of the faculty and of individual faculty members themselves; it is the faculty who determine the nature of the curriculum, the priorities for faculty work, and even the faculty workload. Hence, the idea of increasing faculty productivity runs counter to the personal and professional interests of faculty and the way they (and almost everyone else in university life) have come to define a meaningful faculty role in educating students. The result is a university president's or dean's worst nightmare: They need to convince faculty to change how and what they teach, but faculty themselves are in charge of the very decision-making processes that determine what they do.

Gordon Winston, writing in *Change* (January/February 1993) about the economics of colleges and universities, summed up the depth of this challenge:

> *We've got a whole generation of faculty (and young administrators) who have never seen anything but the lush 1980s and a larger number who have persuaded themselves that the expansion of the '80s were normal....*

The fundamental challenge to college administrators over the next few years, arguably, will be to induce a highly resistant community to understand that there's an economic reality within which they'll have to live, one that may include "downsizing" and "restructuring" and the biting of all sorts of personally painful bullets.

Higher education's predicament is not very different from that being faced in the corporate and health care worlds: Survival depends on radical change, yet the people needing to change the most are in control of the decision-making processes that must deal with the change. On campus, as elsewhere, institutional leadership and strong doses of courage are required.

Our thinking about how to increase faculty productivity is undermined by unexamined assumptions about how faculty members influence student learning. In effect, the status quo is based on two overarching assumptions:

- Faculty members teaching groups of students in a classroom

setting are essential for effective student learning; and, based on this assumption,

- Increasing the productivity of faculty members requires increasing the number of classes taught and/or the number of students taught in a particular class.

Some productivity gains no doubt can be produced by faculty just teaching more, that is, by doing more of what they now do. But I don't believe the volume of activity is the appropriate goal: The issue is not how many courses faculty teach, but how much students learn. A few more faculty members teaching more courses will not reduce significantly institutional expenses or increase student learning.

The reality is that faculty do work hard and much of that work does not involve doing research. A good deal of their time is spent teaching, as well as in other non-research, non-teaching activities. Indeed, the significant changes and reduction in administrative expenses, which are an essential first step in reducing university costs, likely will increase the amount of non-teaching work faculty members perform.

Tinkering with the balance between teaching and research will not radically alter institutional expenses; neither will reducing wasteful activity and meetings. Surely there can be modest gains as faculty teach a bit more and fewer people are hired as part-timers. But these savings will be small and will not, even in the short term, make a real difference in the underlying expense structure of a college or university.

By the same token, cutting departments or even entire schools will not solve the financial problem. We could make such cuts (and all the small changes above) and probably survive, but the reality would be an ever-increasing downhill struggle entailing big, new costs to the quality of faculty life and to opportunities for student learning.

What follows is one attempt to begin the discussion needed to answer the challenge of restructuring the role of faculty over the next five to 10 years. In this effort, there is no one model for success, except that faculty and administrators must work together to create alternatives to the present arrangements. In doing so, they must simulate the human and financial benefits and costs of these alternatives. There is, however, one model for failure; that is, to deny the reality that we need to restructure the roles of administrators and faculty in order to reduce institutional expenses and student costs.

I venture into this arena not out of a deep understanding of all that could be done, but in an attempt to break through the generic assertion that "what we need to do is restructure what faculty do" but without giving any examples of what is meant by doing so. Further, there are now

a number of articles appearing that appropriately stress the need to introduce new information technologies, but don't develop examples of how this might be done—and especially how it relates to what we know about student learning. The following discussion attempts to meet the challenge of rethinking the role of faculty and the use of new technologies to enhance student learning and reduce student costs.

Restructuring the Role of Faculty

The alternative to the present role of faculty states the problem and challenge: To create learning environments focused directly on activities that enhance student learning, we must restructure the role of the faculty to maximize essential faculty-student interaction, integrate new technologies fully into the student learning process, and enhance student learning through peer interaction.

The radical restructuring of the faculty role called for here requires that we understand anew how faculty contribute best to student learning—an understanding that is readily available in our research literatures but that is uncommonly put into practice by faculty.

Let me begin with a set of conclusions:

- Key elements of the student learning process can be accomplished effectively only through the human interaction of students and faculty members.
- Key elements of the student learning process can be accomplished effectively using electronic technologies, especially new information technologies.
- Key elements of the student learning process can be accomplished effectively through peer interaction without the presence of a faculty member and by students learning by themselves inside and outside the institution.

These propositions are the cornerstones of the proposals that follow. My proposals in brief are that students will spend more time learning by themselves and with their peers and much more time engaged with powerful, interactive technologies, and will spend less actual time—but more creative, intensive, and focused time—with faculty members. Faculty, in turn, will work with greater numbers of students but "teach" much less.

Student Learning

Student learning at the undergraduate level is very complex, in our aims and in what is achieved, whether directly or indirectly. We want students to learn about a lot of things. We want them to accumulate information and knowledge in a host of fields, with depth in at least

one. We expect students to develop skills not only in writing and communication but in the use of quantitative and scientific methods and in the learning of a foreign language. Even more important, we have strong expectations regarding students' conceptual learning—the development of conceptual, intellectual tools that enable them to compare and contrast the material they are acquiring and to make judgments about its relevance to other issues of concern.

These three types of learning—accumulation of information and knowledge, skill development, and conceptual development—occur more or less effectively in most institutional learning environments. Nevertheless, ample evidence exists that there are certain settings that foster such learning. Psychologist Donald Norman discusses the optimal environment for the individual student. Arthur Chickering and Zelda Gamson—both higher education researchers—refer to how faculty can increase student learning through better practices. Together these two approaches help us better understand what we might look at to enhance student learning.

Based on what we know today, Norman states the optimal environment for learning exists when we

- provide a high intensity of interaction and feedback;
- have specific goals and established procedures;
- motivate;
- provide a continual feeling of challenge that is neither so difficult as to create a sense of hopelessness and frustration, nor so easy as to produce boredom;
- provide a sense of direct engagement, producing a feeling of directly experiencing the environment, directly working on the task;
- provide appropriate tools that fit the user and task so well that they aid and do not distract; and
- avoid distraction and disruptions that intervene and destroy the subjective experience.

Chickering and Gamson, in their influential article, "Seven Principles for Good Practices in Undergraduate Education," summarize many years of research on good practice in college teaching. They conclude that good practice

- encourages student/faculty contact;
- encourages cooperation among students;
- encourages active learning;
- gives prompt feedback;
- emphasizes time on task;
- communicates high expectations; and
- respects diverse talents and ways of learning.

These optimal settings present a clear message to most colleges and universities: The primary learning environment for undergraduate students, the fairly passive lecture-discussion format where faculty talk and most students listen, is contrary to almost every principle of optimal settings for student learning. Lecture and lecture-discussion formats are overwhelmingly common at most universities where large classes, multiple-choice exams, and teaching assistants are the norm. This situation also is true for too much of education in most smaller colleges. Intimate faculty/student contact that encourages feedback, motivates students, and allows students to perform is the exception, not the norm. Direct engagement outside of class and other formal settings is not common, and students only occasionally are provided vehicles for real peer, collaborative learning with and without faculty.

Learning Strategies

In focusing on human and technological learning strategies that could help us think through alternative ways for faculty to practice their profession, both in classroom and non-classroom settings, this effort attempts to turn the typical discussion of the role of faculty upside down. The focus is not on how faculty teach but on how students learn, and doing whatever it takes to enhance such learning.

I believe rethinking what faculty do can be accomplished because so much effort currently is expended using methods that are not very effective in producing high levels of student learning—namely talking at students in fairly large groups and imparting information to them. And, it is precisely this function that will be most easily and effectively performed by the new computer technologies.

I also believe that faculty spend precious little time involved in activities unique to faculty that have major impact on student learning—namely direct, individual faculty/student interaction, intense small group discussions, mentoring and advising—and in encouraging students to be involved in activities that are important for student learning but do not involve faculty—peer-group, team-oriented settings, peer tutoring and coaching, and experiential learning outside the institution (see Alexander Astin's [1992] research). Further, I believe faculty members can effectively and efficiently use new technologies in a way that will enhance and/or often substitute for a good deal of their present teaching method, thereby freeing them to spend time with more students and to have a greater impact on the learning of all these students.

The above points form the context for the following analyses, which borrow from Donald Norman's discussion of student learning in his 1993 book, *Things That Make Us Smart*.

1) Accumulation of Information and Knowledge

This learning strategy is rather straightforward and represents a good deal of what occurs in higher education today. The common format is the faculty lecture or lecture/discussion. In addition to using books, an old "tool" for maximizing this presentation of information, faculty sometimes use visual aids, such as films, videos, and the like.

It is hard to imagine an area more ripe for new information technologies, some of which exist and many of which are forthcoming on a monthly basis. Over the next five to 10 years, sophisticated interactive software for college-level subject matter will be easily accessible. While the initial cost of developing such interactive technologies is high, the size of the higher education market will attract enterprising software developers and will lead to reasonable costs. In fact, as the market for software grows, the growth in software choices probably will be exponential.

Beyond interactive technology is the ready access to an "information superhighway" where students can gather information from all over the nation and world, access numerous library catalogs and databases, and communicate freely on their own with peers and experts. The growth of new "superhighways" definitely will happen within the next few years, as will the availability of vast amounts of information in a variety of formats.

The power of these new technologies is enormous, especially for student learning and access. Students will be able to gain access to these storehouses of information, knowledge, and human-electronic interaction anytime and at any place, which will enable those with different learning styles to adapt the information and ideas to their special needs.

A major faculty role, and especially the role of the librarian as information technology expert, will be to guide students to these sources by helping them learn how to ask the right questions. I believe the combination of good human and technological guides and well-developed electronically interactive formats will be essential in enabling students to explore the vast potential of the new electronic resources. Rather than the faculty member providing this information through lecture or lecture-discussion formats, a librarian/information technology expert and/or appropriate written and technology-based guides will be able to do so.

Courses as we now know them may be altered radically so a student would learn a particular subject area in a series of "learning blocks," with one block focused on electronic sources, another on intensive interaction with a faculty member, a third on intensive lecture-discussion formats over brief periods of time, a fourth in real-life experiences or simulations,

and even another as a peer-study group. Evaluation of student learning in a particular area would include separate assessments of the learning achieved in each of these blocks integrated into a total assessment of the learning demonstrated.

2) Skill Development

High-level skill development represents a good deal of the work of colleges and universities: From the more basic levels of math, quantitative methods, writing, communicating, and foreign languages to the higher-level skills of research and scholarly methods, to the arts and communication technologies, skill development is very much a focus of our efforts.

Coaching. A critical aspect of skill development, coaching occurs when an experienced individual uses a combination of tips, advice, and example to help a student avoid unnecessary pitfalls. What seemed insurmountable in the beginning (such as acquiring the speed of a native speaker in a foreign language) readily becomes understandable and easily performed as the skill is developed. The coach provides continuous feedback, encouragement, and in many cases, demonstration.

Obviously, coaching performed by a highly experienced expert may be desirable, but it is not always necessary. Communication-oriented foreign language training sessions can be led by relatively inexperienced native speakers and upper-division students fluent in a language, who have been taught a specific method of teaching languages. Having highly paid faculty teach grammar or even spoken language is less effective and more costly than a skill-oriented, spoken language program. The Peace Corps, for example, has been teaching languages this way for more than 30 years.

The efficiency of this model can be striking. At Antioch College, the number of languages taught using this approach tripled without increasing the number of faculty and by very modestly increasing the costs for assistants. The key to the program's success is its conception of language learning: The focus is on students' ability to use the language and native speakers' following a well-thought-out linguistic method that emphasizes communication.

In fact, a good argument can be made for coaching/tutoring in many skill areas where upper-level students are paired with lower-level ones in a fairly intimate learning environment. Peer coaching in lower levels may be more effective than faculty coaching because the older peer really understands how to overcome learning hurdles that are but faint memories to faculty members. Evidence shows that in such peer coaching situations, both the upper- and lower-level students increase their learning. The combination of more effective learning and reduced

expenses may well be a powerful motivation for increasing this learning method.

While interactive technology cannot substitute for human coaching, there are many skill areas—including language learning—where interactive technologies and computer analysis can be a major aid in reducing the time needed for human coaching by highly trained experts.

Simulation. The advances just beginning to occur in software that simulates science laboratories could be a boon to colleges and universities. Using this software can reduce significantly the expense of costly laboratory materials and of maintaining extremely expensive specialized labs. While these simulated laboratories are in the early stages of development, it is highly likely that as universities seek to cut costs, the market for such software will grow significantly, increasing the quantity and quality of the simulations.

The extent to which such simulation technology is developing was highlighted in a *New York Times* article (Oct. 31, 1993) that described how new virtual reality technology is being developed to train surgeons:

> *Virtual reality, the use of electronic sensors and computer-generated images to give people the illusion of participating in fabricated events, is moving beyond the game room and into practical applications in medical schools and other real-life settings.*
>
> *Just as flight simulators have long been used to train pilots before they climb into actual airplanes, authorities in a variety of fields say virtual reality "environments" have a bright future as a training tool for students and as a way to give doctors and engineers a "dry run" through risky or costly procedures.*

It is likely that because of the ease of use and the reduced need for lab staff, students using computer-simulated laboratories will be able to carry out more experiments and learn more about "doing science" than otherwise possible. And because these simulation experiences can be carried out at any time and place—and easily repeated—students with different learning styles will learn at their own pace and achieve the same level of understanding as those more attuned to the formal laboratory settings. It is possible that the flexibility and availability of computer-simulated laboratories actually will increase the quality of student work. Also, since small groups of students will be able to work together more easily at their own convenience, there is more potential for increasing learning.

The key to successfully using such simulated lab experiences in honing the skills of undergraduate science students will be understanding

the balance between hands-on work in a lab and the use of computer simulation. How much real touching and feeling of the equipment and chemicals is necessary for a student to "do" science? Surely, some is necessary, but just how much if we focus on the learning needs of students and not the traditions and past practice of faculty members? It also must be emphasized that students entering college in the next five to 10 years will be attuned to working in computer-generated environments—whether from playing games, traveling the information superhighway, or working with interactive television systems.

An interesting byproduct of changing the nature of science labs is the implication for academic calendars. Since the large blocks of time needed to schedule science labs are usually major impediments to serious calendar revisions, shortening the time spent in labs and increasing the time spent on computer simulations has profoundly positive implications for calendar changes as well as student learning.

3) Conceptual Development

Most educators consider conceptual learning the cornerstone of a good undergraduate education. Conceptual learning is hard work; it not only requires a good deal of reflection, but it literally forces students to restructure how they think about a particular area of life and, as a result, to readjust the ideas they have about it.

As students advance through their undergraduate education, they are expected to form new conceptual abilities. Unfortunately, when the faculty use instructional strategies that are not consistent with a reflective mode of learning and that do not motivate students, such restructuring of conceptual frameworks is difficult to achieve. Norman (1993) writes:

> *...the trick in teaching is to entice and motivate the student into excitement and interest in the topic, and then give them the proper tools to reflect; to explore, compare, and integrate; to form the proper conceptual structures....*
>
> *...the problem is to make students want to do the hard work that is necessary for reflection.*

Motivation turns out to be the key. If a highly entertaining environment creates such motivation, fine, although most entertainment is not reflective in orientation. Norman's studies show that students who were highly motivated learned material far better than those who were uninterested, irrespective of how the material was presented.

Faculty members who helped train the early groups of Peace Corps

volunteers found, to their delight, that the volunteers were so motivated to learn that the faculty were unprepared to deal with them because of the faculty members' experiences in typical classroom settings. Many volunteers were average college graduates who were focused intensely on going overseas to serve, and thus hungry to learn anything they could about the country in which they were going to live and work for two years. Challenging questions were common, and students' attempts to project themselves into the reality of their new country led them to rethink their views about the Third World and their own country. As someone who went through the training, I know that this intense and challenging new learning was not easy, especially given the time pressure, but it was exciting for everyone because the volunteers were so highly motivated to learn.

The typical faculty/student lecture-discussion rarely reaches these levels of motivation, even in the hands of the best faculty. Yet we know that our students spend hours intensely involved in activities they care about. Norman (1993) writes about game makers:

> *They obviously know how to capture interest sufficiently well that real learning takes place, albeit learning of irrelevant subjects.*
>
> *The solution is to merge what each group of people can do best. Educators know what needs to be learned; they are simply pretty bad at figuring out how to get the intense, devoted concentration required for the learning to take place. The field of entertainment knows how to create interest and excitement. It can manipulate the information and images. But it doesn't know what to teach.*
>
> *Perhaps we could merge these skills. The trick is to marry the entertainment world's skills of perception and of capturing the user's engagement with the educator's skills of reflective, in-depth analysis.*

It is difficult to imagine the present generation of students sitting day after day and week after week, focusing on and listening primarily to lectures—even exciting ones involving discussion. It is more likely that they will be better focused and more motivated in well-designed settings using interactive technologies. The challenge for faculty members will be to integrate the new world of simulation and interactive technologies with their own unique role as mentors, coaches, facilitators, and teachers of student learning.

Simulation. Interactive technology and computer simulation can play an important role in reflective thought if they are designed well, allowing a student to delve deeper and deeper into areas of interest while encouraging reflection. Much of this level of highly sophisticated interactive technology is only a few years away. But when it does arrive it

will find ready takers among the student body, if not as easily among the faculty.

Mentoring and Human Simulation. Human simulations, too, are exciting ventures that will expand the learning environment for students while containing costs.

There are many instances where creative faculty have redesigned their undergraduate courses as learning laboratories, using simulated environments to motivate and challenge students to reflect on their beliefs and actions (for example, simulating school and city decision-making settings in developing research projects). A similar classroom strategy involves teaching through case studies, which in creative hands can simulate problem-solving activities. These strategies combine the excitement of experiential learning with the intensity and focus necessary for reflection, thereby creating powerful learning environments for conceptual development. Unfortunately, such courses are the exception and occur in the context of three or four other classes offered in the typical lecture-discussion format.

Mentoring and Small Group Intensive Discussions. While there are many times when one-on-one faculty/student interaction facilitates reflection, small group discussions also can be very effective environments for such learning. Students not only receive support from their peers for their new conceptions but can share their different perspectives and even feel comfortable remaining silent and thinking. At the same time, the pressure of peers can provide an intensity and excitement to discussions—if the faculty member knows how to lead small group discussions.

A faculty member serving as a mentor/group leader can provide students with feedback and focus that challenge conceptual thinking while enabling students to build a sense of confidence in their own ideas. This type of faculty-student interaction is obviously a labor-intensive activity, but it is very important for enhancing student learning. When these intense group discussions, which can take place over a limited period of time, are integrated with information and experiences acquired in settings without faculty presence, the goal of reducing expenses and enhancing student learning can occur. It is possible that by doing this faculty members can spend less time with more students than would be the case in most college courses while, I believe, having more impact on student learning.

Testing Ideas in Real-Life Experience and Reflection. The growth of student interest in community service activities provides settings in which ideas can be tested through direct experience. Such off-campus experiences, which enable students to apply ideas or experience new

environments, are important but do not necessarily emphasize reflection and conceptual development. What converts these experiences into a setting for conceptual development is relating the experiences to others through writing, presentations, and reflection.

Faculty and/or peer advisors can play a critical role in many ways in enhancing a student's reflection: raising questions, providing alternative conceptions from the student's, encouraging the student to tie together intellectual studies and life experiences, and providing feedback throughout the student's experience. This is a labor-intensive activity, but, like small group discussions, it can be cost effective and can enhance student learning provided the institution views the student's experiential and reflective learning as legitimate parts of university learning. Linking experiential learning in real-life settings with student reflection through written reports and presentations, while faculty act as mentors/advisors, is learning in its broadest sense. Since the experiences occur beyond the campus, their actual institutional costs are small; substantial costs do occur, however, in the faculty-student interactions focused on encouraging students to reflect on their experiences.

One-on-One Advising and Faculty-Student Interaction. Often faculty view advising as a limited exercise enabling students to understand which courses to register for to meet institutional graduation requirements. However, the best faculty advisers use this role to mentor and coach as much as advise: they encourage students to see how new learning can relate to earlier learning; discuss with them students' concerns about their future, about relationships to students; and provide adult experience and wisdom to a searching young (or older) student. All these provide the intimacy of faculty/student interaction that is long remembered by students.

Learning Independently and With Peers. It is probably obvious that many students learn in a reflective mode on their own or as a result of one of the instructional learning strategies discussed above. While there are considerable learning style differences in this regard—some people can reflect more effectively alone while others do so in small groups of peers—providing for such independent learning and legitimizing it as part of a student's education is important for conceptual development to take place. This type of learning obviously requires a relatively small expenditure of faculty and institutional resources.

Implications

Restructuring the role of faculty and integrating new electronic technologies with these new roles will have significant impact on many aspects of academic life. I expect that the very nature of how we structure all aspects of educating students will change.

Probably the most significant implication will be in the university's expectations for the role of the student in the learning process. Too often, students today are treated as if they are passive recipients of information and knowledge, even though we know the most effective learning occurs when students are active learners. Restructuring the role of faculty as outlined previously—or in almost any other scenario—and integrating new computer technologies into the learning process will mean that students must be active and more independent learners. There also will be an increased emphasis on intrinsic motivation rather than external rewards, which leads to more effective conceptual learning.

From passive to active learner, from an emphasis on learning primarily in larger groups to a focus on smaller, more intimate groups and independent learning, from being concerned with extrinsic rewards to a concern for internal motivation—these changes in the role of student as learner will not fall easily on students trained throughout their education to be passive learners in larger groups focused on grades. But besides learning more, the concrete benefits to the individual student will be considerable—greater access to high-quality education at substantially reduced costs.

Faculty members will benefit from this new student role by having more exciting student learners and a university that could afford adequate faculty salaries and learning resources. The benefit to society may be better-educated students, who will be needed badly in the technologically intense and sophisticated 21st century.

A second implication of the new faculty role is that wholesale alterations would have to be made in the academic calendar as we now know it. The calendar will need to be more flexible to allow different subject matter to be taught and learned using different time patterns, and to encourage and enhance different learning styles. As mentioned earlier, in many areas students would learn a great deal of the subject matter using a series of learning blocks, with different blocks focused on electronic sources; peer-study groups; intensive, faculty-led mini-lecture-discussion sessions; intensive, short-term, faculty-led seminar discussion sessions; or off-campus learning by doing.

For the most part, the present academic calendar enables faculty to teach groups of students in classroom settings meeting two or three times per week. If the calendar becomes refocused to deal with the needs and tools of student learning, it would be very different than it is now.

Third, the present undergraduate curriculum would have to change from its focus on faculty disciplinary interests to a focus on student learning. This will require a significant philosophical shift for almost all colleges and universities, even most small liberal arts colleges.

The restructuring of the faculty role over the next five to 10 years also will require significant changes in assessment procedures. If our primary focus is on student learning and if such learning occurs in a number of different settings—intense faculty/student interaction, teams of peers, the use of interactive technologies, reflection on experience—student assessment must focus on the individual student and what he or she has learned. An individual faculty member evaluating a group of students by grades, or otherwise, would be inappropriate. I expect a number of different methods might be tried with a focus on student proficiency that could be demonstrated in a number of different ways depending on the student's learning style. It also is possible that there will be more focus on student learning contracts developed in close interaction with faculty.

Maybe all this is just wishful thinking, but the assessment of student learning may become a primary area of faculty-student interaction—an interaction that possibly could have considerable positive impact on students.

Changes Needed

Colleges and universities are locked in an unexamined educational delivery system that is increasing in costs while, at best, maintaining a steady state in student learning. Even some of the better reforms being considered, which require years and a great deal of human energy to implement, will not produce significant increases in student learning nor stem the tide of increasing institutional expenses and student costs, if they accept as basic the present underlying educational process and relationship between faculty and students.

Restructuring the role of faculty is a monumental undertaking, more difficult and more significant than the administrative restructuring that must precede it. If successful, faculty members will change their present teaching practices and become primarily concerned with enhancing and facilitating student learning. To accomplish this, many faculty will need to acquire additional skills.

This is a difficult challenge, but one we must face. The unacceptability of student costs will drive us to change, new technologies will challenge us to alter our practices, and society will force us to be accountable. And if we do not reduce costs creatively, it will be done for us by federal and state governments or the marketplace. We must begin by asking ourselves, If in the next five to 10 years we have to cut faculty positions 25 to 30 percent without significantly increasing class size or faculty workload, how would we do it?

It is just possible that if we reduce administrative and student

services expenses by 25 to 33 percent and the size of the faculty by 25 to 33 percent, we might be able to hold down student costs. And, if we carry out these changes creatively, we might accomplish this while also enhancing student learning.

Summary Table

Restructured Faculty Role and Use of New Technologies

Types of Student Learning	Faculty Role	Peer-Group Role/ Individual Learning	Technology
Accumulation of Knowledge and Information	Faculty presenter; faculty or librarian as guide to resources; faculty assessment of learning	Independent learning; use of guides to access new technology and/or to help with independent learning	Interactive technologies; access to databases; communication technology network with others throughout country
Skill Development	Faculty coaching outside of class; faculty as group discussion leader; faculty as trainer of student coaches	Older and more experienced peers as coaches; action settings using skills	Interactive technologies; computer simulation
Conceptual Development	Faculty as mentor and model; small group discussion leadership; faculty as convener of cooperative learning groups; one-on-one advising; faculty-student interaction	Peer-group interaction—cooperative learning groups; testing ideas in real-life experience; independent learning	Simulation/virtual reality; human simulation; communication technology networks

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